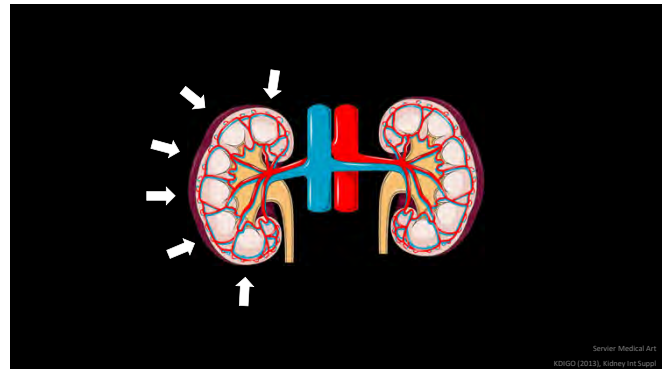


Determinants and Consequences of Nutritional Status in Patients with Chronic Kidney Disease

Helene Dahl
Dietitian and Researcher
19.01.23



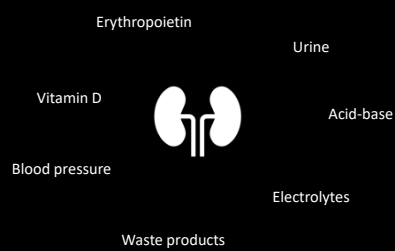
Source: Medical Art
KDIGO (2013), Kidney Int Suppl

Background

Estimated glomerular filtration rate (eGFR)



Source: Medical Art



Webster AC (2017), Lancet

Chronic kidney disease (CKD)

"Abnormalities of kidney structure or function, present for >3 months, with implications for health."

KDIGO (2013), Kidney Int Suppl

Common primary causes of chronic kidney disease



Nutritional status

"The degree to which the individual's physiologic need for nutrients is being met by the foods he/she is eating. It is the state of balance in the individual between the nutrient intake and the nutrient expenditure or need."

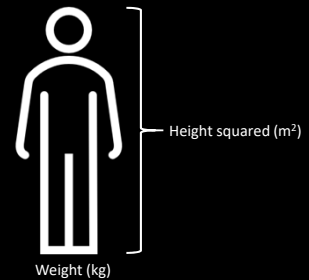
Cederholm T (2016), Clin Nutr
Krause MV (2019), Nutr Diet Ther

CKD stage	eGFR, ml/min/1.73 m ²
1	> 90
2	60-89
3	30-59
4	15-29
5	< 15

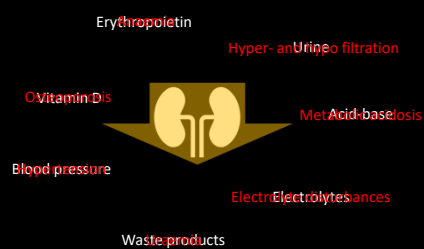
KDOQI (2013), Kidney Int Suppl

Body mass index (BMI)

BMI category	BMI kg/m ²
Underweight	< 18.5
Normal weight	18.5-25
Overweight	25-30
Obesity	> 30



WHO (2000)



Webster AC (2017), Lancet

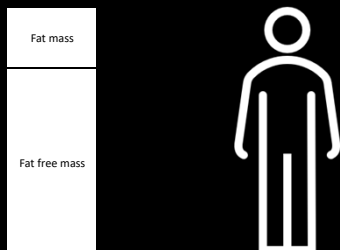
Waist circumference

Cut-offs central obesity	
Male	> 102 cm
Female	> 88 cm



WHO (2008)

Body composition

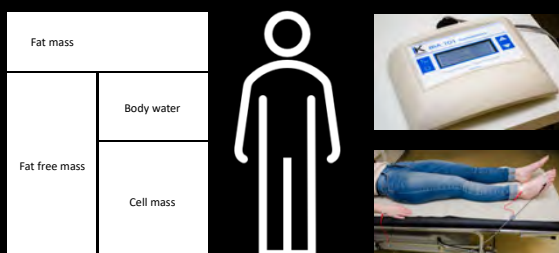


Sarcopenia

"A progressive and generalised skeletal muscle disorder that is associated with increased likelihood of adverse outcomes including falls, fractures, physical disability and mortality."

Cruz-Jentoft AJ (2015), Age Ageing

Bioelectric Impedance Analysis (BIA)



Pictures owned by University of Bergen

Diagnosis: European Working Group on Sarcopenia in Older People (EWGSOP)

Consensus	Measure	Male	Female
EWGSOP1	Handgrip strength	< 30 kg	< 20 kg
	Appendicular Lean Mass/height ²	< 8.87 kg/m ²	< 6.42 kg/m ²
EWGSOP2	Handgrip strength	< 27 kg	< 16 kg
	Appendicular Lean Mass	< 20 kg	< 15 kg
	Physical function tests		

Cruz-Jentoft AJ (2015), Age Ageing
Cruz-Jentoft AJ (2019), Age Ageing

Handgrip strength



Picture owned by University of Bergen

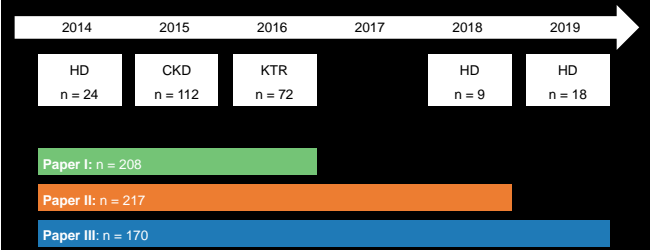
Rationale



Overall aim

To assess nutritional status in patients at different stages and treatment modalities of CKD and investigate possible determinants and consequences of nutritional status.

Patient inclusion



Specific aims

- I To assess nutritional status at different CKD stages and with different CKD modalities.
- II To describe the medication prescription in a population of patients with CKD and investigate the association between nutritional status and medication prescription.
- III To assess the association between nutritional status and mortality in patients at different stages of CKD and with different CKD modalities.

Data collection

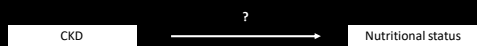


Height
Weight
Waist circumference
Skinfold thickness
Body composition
Handgrip strength
Mid-upper arm circumference

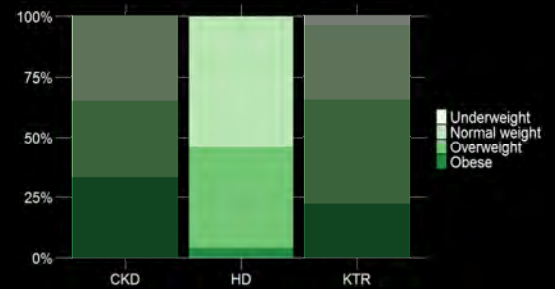
Data collection

Results

Paper I



BMI



Decker et al. BMC Nephrology (2019) 19:209
 https://doi.org/10.1186/s12917-019-1858-4

BMC Nephrology

RESEARCH ARTICLE Open Access

High rates of central obesity and sarcopenia in CKD irrespective of renal replacement therapy – an observational cross-sectional study

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Abstract

Background: Poor nutritional status of patients with renal disease has been associated with worsening of renal function and poor health outcomes. Simple measuring weight and height to calculate the body mass index does however not capture the true picture of nutritional status in these patients. Therefore, we measured nutritional status by BMI, body composition, waist circumference, dietary intake and nutritional screening in three groups of renal patients.

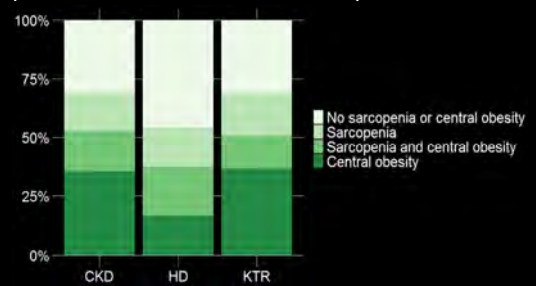
Methods: Patients with chronic kidney disease had an renal replacement therapy (CKD stage 3–5, n = 112) after renal transplantation (n = 72) and patients treated with hemodialysis (n = 26) were recruited in a tertiary hospital in Norway. Norway is a cross-sectional observational study. Dietary intake was assessed by a single 24-h recall. All patients underwent nutritional screening, anthropometric measurements, body composition measurements and functional measurements (hand grip strength). The prevalence of overweight and obesity, central obesity, sarcopenia, sarcopenia and obesity and nutritional risk was calculated.

Results: Central obesity and sarcopenia were present in 40% and 31% of patients, respectively. 40% of patients with central obesity were normal weight or overweight according to their BMI. Patients associated with central obesity were a diagnosis of diabetes and increased fat mass, while factors associated with sarcopenia were age, female gender, number of medications. An increase in the BMI was associated with lower risk for sarcopenia.

Conclusions: Central obesity and sarcopenia were present in renal patients at all disease stages. Most attention to these unfavorable nutritional status is warranted in renal patients.

Keywords: ESRD, Renal disease, Nutritional status, Sarcopenia

Sarcopenia and central obesity

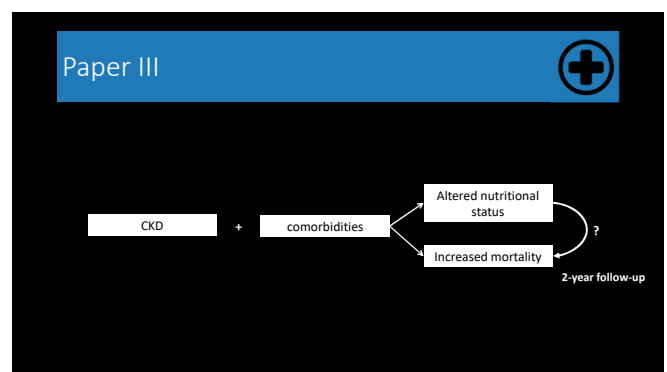
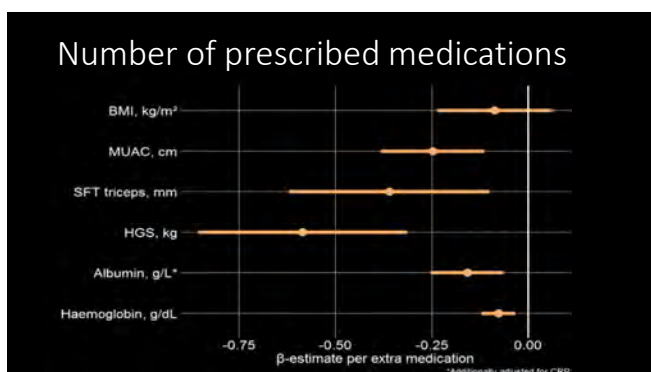
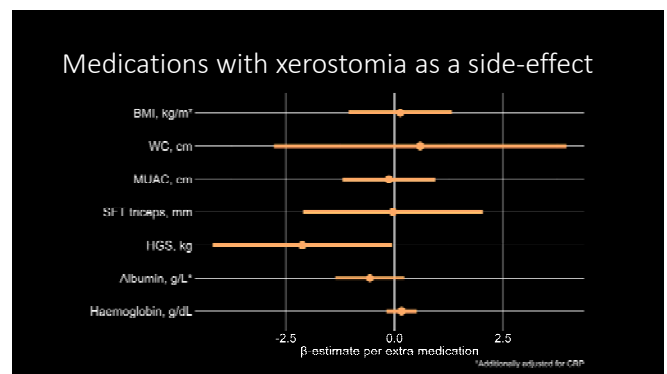
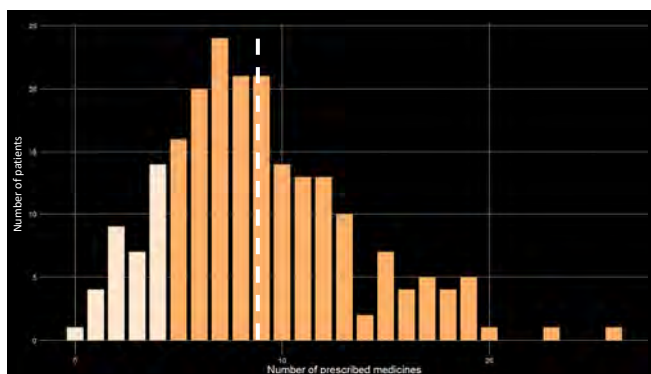
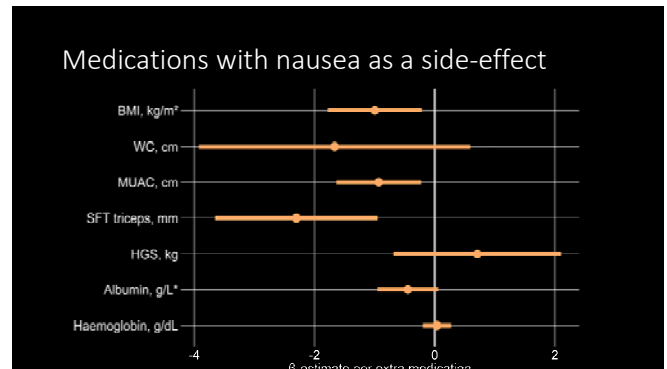


Characteristics

	CKD	HD	KTR
	n = 112	n = 24	n = 72
Female, %	29 %	29 %	29 %
Age, years	66	63	60
BMI, kg/m ²	27.8	24.7	26.7
eGFR	28	6	53

Paper II



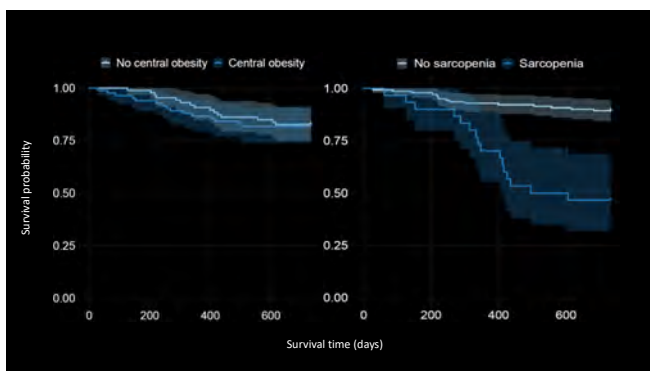


Characteristics

	Alive	Deceased
	78 %	18 %
Female, %	28 %	29 %
Age, years	61 (15)	74 (13)
BMI, kg/m ²	26.6 (4.5)	26.0 (4.9)
eGFR	30 (21)	20 (18)

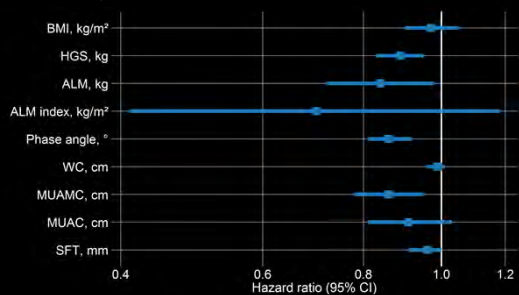
Conclusions

- Patients with CKD experience several challenges related to nutritional status, especially related to muscle mass and – strength, and overweight and obesity.
- Long lists of prescribed medications are associated with diminished nutritional status.
- Diminished nutritional status, especially sarcopenia, is associated with increased mortality risk.



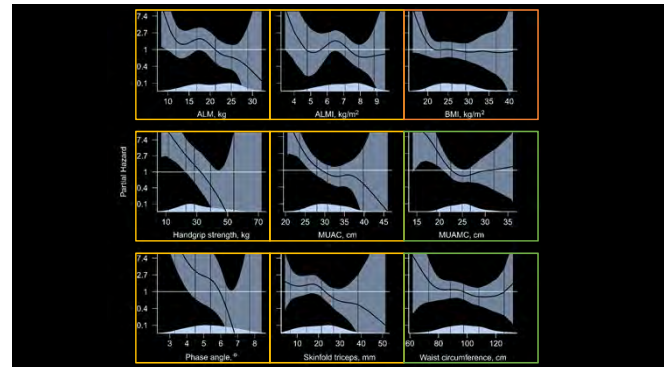
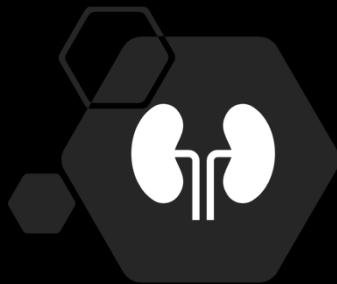
Now what?

Mortality risk



Clinical practice

Thank you



Number of prescribed medications

